

What is Continuity?

In your groups, take a moment to come up with an "everyday" definition of a **continuous** function.

Don't be concerned about it being rigorous. The definition should make sense to a random person walking down the street.

In a few minutes we will share a couple of these definitions.

Actual Problem from the 2011 AP Exam

Let f be a function defined by $f(x) = \begin{cases} 1 - 2 \sin x & \text{for } x \leq 0 \\ e^{-4x} & \text{for } x > 0. \end{cases}$

(a) Show that f is continuous at $x = 0$.

Draw a function that has the following attributes:

- 1.) Only exists on the domain $-4 \leq x \leq 4$.
- 2.) Has a removable discontinuity at $x = -2$.
- 3.) Has an infinite discontinuity at $x = 0$.
- 4.) Has a jump discontinuity at $x = 2$.
- 5.) Is continuous at all other points on the domain.

Here's the real challenge: Can you write the piecewise equation for this function?

Summary: What is the "mathematical" definition of continuity?

Homework: Review today's notes on Limits to Infinity and continuity. You will receive your next problem set tomorrow.

TEST: Unit 1 Test - Tuesday, 9/16